

WHAT IS CLAIMED IS:

- 1                   1.       An inventory label generating method comprising:  
2                   generating a plurality of candidate labels; and  
3                   selecting a plurality of acceptably distinguishable labels from among the  
4 candidate labels by determining spectra emitted by the candidate labels when the  
5 candidate labels are energized, and by comparing the spectra of the candidate labels.
- 1                   2.       The method of claim 1, wherein the labels comprise semiconductor  
2 nanocrystals.
- 1                   3.       The method of claim 1, wherein the candidate labels are generated  
2 by combining a plurality of markers, each marker emitting a marker signal at an  
3 associated signal wavelength in response to excitation energy.
- 1                   4.       The method of claim 1, further comprising directing an excitation  
2 energy toward the markers and measuring the wavelength/intensity spectra emitted by the  
3 labels.
- 1                   5.       The method of claim 1, wherein the wavelength/intensity spectra of  
2 the candidate labels are determined by modeling a combination of a plurality of marker  
3 signals.
- 1                   6.       The method of claim 5, further comprising calculating at least one  
2 of the signals by modeling emissions from a manufacturable marker.
- 1                   7.       The method of claim 6, further comprising adjusting the calculated  
2 signals from the manufacturable marker in response to measured marker signal variations.
- 1                   8.       The method of claim 5, further comprising measuring at least one  
2 of the signals by energizing a marker so that the marker emits the signal.
- 1                   9.       The method of claim 1, further comprising comparing at least some  
2 of the candidate labels with a library of distinguishable labels to determine if the  
3 candidate labels are acceptable, and adding acceptable candidate labels to the library.
- 1                   10.      A method for identifying a plurality of identifiable elements, the  
2 method comprising:

3 energizing a plurality of labels so that a first marker of each label  
4 generates a first signal with a first wavelength peak, at least some of the labels comprising  
5 multiple-signal labels, each multiple-signal label having a second marker generating a  
6 second signal with a second wavelength peak;  
7 measuring the first wavelength peaks;  
8 for each multiple-signal label, measuring the second wavelength peak at at  
9 least a predetermined minimum wavelength separation from the associated first peak; and  
10 identifying the labels in response to the measured peaks.

1 11. The method of claim 10, wherein each predetermined minimum  
2 wavelength separation is at least as large as a full width half maximum (FWHM) of at  
3 least one of the associated first peak and the associated second peak.